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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,503	08/15/2001	Tetsufumi Tsuzaki	50395-102	8232

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EXAMINER

CUNNINGHAM, STEPHEN C

ART UNIT	PAPER NUMBER
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3663

DATE MAILED: 11/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,503

Applicant(s)

TSUZAKI ET AL.

Examiner

Stephen C. Cunningham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

1. Claims 1, 4, 6, 7, 9, 10, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyakawa et al. '123

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

With respect to claim 1, Miyakawa et al. '123 teach a gain module comprising:

a plurality of optical fibers which differ from each other with respect to composition; and

one or more pump light sources which supply pump light for Raman amplification.

The plurality of optical fibers are selected from single mode fiber (SMF), reverse dispersion fiber (RDF), and dispersion shifted fiber (DSF).

These fibers inherently have different compositions, see figure 1 and page 3.

With respect to claim 4, Miyakawa et al. '123 teach that the fibers are connected in series, see figure 1.

With respect to claim 6, Miyakawa et al. '123 teach that the fibers are pumped with a single wavelength, see figure 1, and paragraph 0023.

With respect to claim 7, Miyakawa et al. '123 teach that the light from one pump source is supplied to said plurality of fibers, see figure 1, and paragraphs 0022 – 0027.

With respect to claim 9, Miyakawa et al. '123 teach that the optical region of at least one of the optical fibers is doped with GeO_2 . See paragraph 0041.

With respect to claim 10, Miyakawa et al. '123 teach that the optical region of at least one of the optical fibers is doped with P_2O_5 . See paragraph 0041.

With respect to claim 12, Miyakawa et al. '123 teach optical communication system comprising optical transmission lines and one or more pump light sources; and

wherein the optical transmission lines comprise a plurality of optical fibers with optical regions of different compositions. See figures 1, 8 and paragraphs 0002, and page 3. RDF, SMF, and DSF inherently have different compositions.

With respect to claim 13, Miyakawa et al. '123 teach a communication system comprising:

a plurality of optical fibers which differ from each other with respect to composition; and

one or more pump light sources which supply pump light for Raman amplification.

The plurality of optical fibers are selected from single mode fiber (SMF), reverse dispersion fiber (RDF), and dispersion shifted fiber (DSF). These fibers inherently have different compositions, see figure 1, paragraph 0002, and page 3.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1-3, 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. in view of Galeener et al.

With respect to claim 1, Ma et al. teach a plurality of optical fiber Raman amplifiers, which inherently contain one or more pump sources. Galeener et al. teach a variety of glass compositions with various relative Raman cross sections. It would have been obvious to modify the

apparatus of Ma et al. by substituting fibers of various compositions for the split band fibers of Ma et al. in order to increase Raman gain.

With respect to claims 2 and 3, Galeener et al. teach that the stokes shift of optical fibers containing SiO_2 , GeO_2 , B_2O_3 , and P_2O_5 are all greater than 400 cm^{-1} . It would have been obvious to modify the apparatus by producing Raman gain fibers out of the taught glasses in order to increase Raman amplification.

With respect to claim 5, Ma et al. teach that the plurality of optical fibers are in parallel.

With respect to claim 6, it would have been obvious to modify the apparatus by pumping fibers with different Stokes shifts with the same wavelength light in order to amplify in different wavelength bands.

With respect to claim 7, it would have been obvious to pump optical fibers with different Stokes shifts with a single pump source in order to amplify in different wavelength bands while minimizing the cost by reducing the number of photodiodes in the apparatus.

With respect to claim 8, it would have been obvious to modify the apparatus by adjusting the wavelengths of the pump light to amplify across the full fiber transmission window.

With respect to claim 9, Galeener et al. teach that GeO_2 has a greater intensity than standard SiO_2 . It would have been obvious to

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modify the apparatus by providing at least one fiber comprising GeO_2 in order to increase the gain of the Raman amplifier.

With respect to claim 10, Galeener et al. teach that P_2O_5 has a greater intensity than standard SiO_2 . It would have been obvious to modify the apparatus by providing at least one fiber comprising P_2O_5 in order to increase the gain of the Raman amplifier.

3. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa et al. '123 in view of Galeener et al.

Galeener et al teach that optical fiber comprising GeO_2 or P_2O_5 has a Stokes shift greater than 400 cm^{-1} .

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa et al. '123 in view of Akasaka et al.

Miyakawa et al. '123 teach a Raman amplifier comprising:

a plurality of optical fibers which differ from each other with respect to composition; and

one or more pump light sources which supply pump light for Raman amplification.

The plurality of optical fibers are selected from single mode fiber (SMF), reverse dispersion fiber (RDF), and dispersion shifted fiber (DSF).

These fibers inherently have different compositions, see figure 1 and page 3.

Akasaka et al teaches a Raman fiber amplifier comprising a control unit. It would have been obvious to modify the apparatus of Miyakawa et al. '123 by adding the control apparatus of Akasaka et al. in order to allow the amplifier to compensate for dynamic input characteristics.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Miyakawa et al. '2000

Spirit et al.

Davey et al.

Aoki

Dianov et al.

Shigematsu et al.

Chang et al.

Grubb et al.

Okuno et al.

Evans et al.

Kawai et al.

Hazell et al.

Masuda

Islam

Masuda et al. '1998

Hansen et al.

Masuda et al. '803

Sasaoka et al.

Suzuki et al.

Chraplyvy et al.

Tsukitani et al.

Foursa et al.

Prabhu et al.

Tanaka et al.

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Desthieux et al.

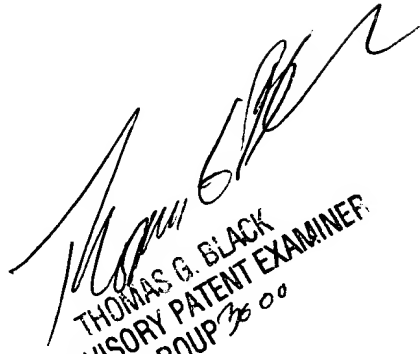
Massicott et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Black can be reached on 703-305-8233. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

October 20, 2002


THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600